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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
THOMPSON, JEWEL VERGIE	

ART UNIT	PAPER NUMBER
2855	

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/773,459	MATTAR ET AL.	
	Examiner	Art Unit	
	Jewel V. Thompson	2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al (6,505,519) in view of Dutton et al (6,318,156)

Regarding claim 1, Henry et al teaches a flow meter comprising: a vibratable flow tube; a driver connected to the flow tube and operable to impart motion to the flow tube; a sensor connected to the flow tube and operable to sense the motion of the flow tube and generate a sensor signal; and a controller connected to receive the sensor signal (col. 65, lines 3-12). Henry fails to teach the controller being operable to determine a first flow rate of a first phase within a two-phase flow through the flow tube and determine a second flow rate of a second phase within the two-phase flow. Dutton et al teaches a Coriolis flow meter 154 and 166 which measures the gas flow rate and liquid flow rate, respectively, of the multi-phase fluid (col. 5, lines 41-44 and col. 5, lines 62-65). It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have used the flow meter of Dutton et al in the apparatus of Henry et al for the purpose of providing proper management of producing oil or gas

fields which demands knowledge of the respective volumes of oil, gas and water that are produced from the fields and individual wells in the fields. This knowledge is used to improve the producing efficiency of the field, as well as allocating ownership of revenues form the commercial sales of bulk production (col. 1, lines 43-47)

Regarding claim 2, Henry teaches the first phase includes a gas and the second phase includes a liquid (col. 56, lines 8-10).

Regarding claim 3, Henry teaches the controller is operable to input an apparent density of the two-phase flow detected by the flow meter and output a corrected density of the two-phase flow (col. 47, lines 31-34).

Regarding claims 4-18, Henry does not explicitly teach the controller is operable to correct the apparent density based on a theoretical relationship between the apparent density and the corrected density; **Claim 5**, controller is operable to correct the apparent density based on an empirical relationship between the apparent density and the corrected density; **claim 6**, the controller is operable to correct the apparent density based on a table storing relationships between the apparent density and the corrected density; **claim 7**, the controller is operable to input an apparent mass flow rate of the two-phase flow detected by the flow meter and output a corrected mass flow rate of the two-phase flow; **claim 8**, the controller is operable to correct the apparent mass flow rate based on a theoretical relationship between the apparent mass flow rate and the corrected mass flow rate; **claim 9**, the controller is operable to correct the apparent mass flow rate based on an empirical relationship between the apparent mass flow rate and the corrected mass flow rate; **claim 10**, the controller is operable to input an

apparent first phase fraction of the two-phase flow detected by the flow meter that defines an amount of the first phase in the two-phase flow and output a corrected first phase fraction of the two-phase flow; **claim 11**, the controller is operable to input a first phase fraction of the two-phase flow detected by a phase fraction sensor that is external to the flowmeter; **claim 12**, the controller is operable to determine the first flow rate and the second flow rate based on corrected values for a detected density and detected mass flow rate of the two-phase flow; **claim 13**, the controller is operable to determine the first flow rate and the second flow rate based on a corrected value for a detected first phase fraction that defines an amount of the first phase in the two-phase flow; **claim 14**, the controller is operable to determine the first flow rate and the second flow rate based on densities of the first phase and the second phase, respectively; **claim 15,** the controller is operable to determine a first superficial velocity of the first phase and a second superficial velocity of the second phase, based on the first flow rate and the second flow rate, respectively; **claim 16** the controller is operable to determine a flow regime of the two-phase flow, based on the first superficial velocity and the second superficial velocity; **claim 17**, the controller is operable to determine a slip velocity between the first phase and the second phase, based on an average velocity of the first phase and an average velocity of the second phase; **claim 18**, the controller is operable to provide corrections to the first flow rate and the second flow rate, based on the first and second superficial velocities, the determined flow regime, or the slip velocity, to thereby obtain a corrected first flow rate and a corrected second flow rate. The abstract of Henry teaches that the "controller is connected to receive the sensor signal. A

controller is operable to detect a single-phase flow condition to generate a validated mass-flow measurement. The controller is also operable to detect a two-phase flow condition and process the sensor signal using a second process during the two-phase flow condition to generate the validated mass-flow measurement" (see abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to have known that the controller of Henry et al could have been "operable" to perform the limitations discussed by the controller for the purpose of validating the mass-flow measurement, since Henry already teaches functions of flow condition measuring which are being performed by controller (105)

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

4,856,344 Hunt teaches a method of measuring the flow of each phase of a two-phase fluid using a flow meter.

6,327,914 Dutton teaches a correction of Coriolis flow meter measurements due to multiphase flows

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jewel V. Thompson whose telephone number is 571-272-2189. The examiner can normally be reached on 7-4:30, off alternate Mondays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jewel V Thompson

Jvt
March 2, 2005